NOAA Fisheries

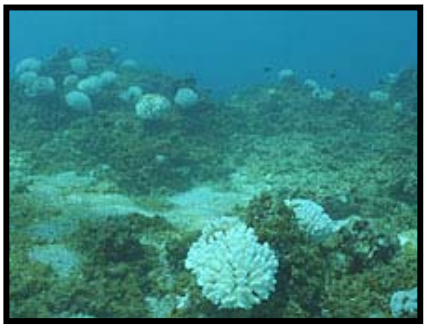
Coral Reef Conservation Program

2002 Pacific Highlight

NOAA Fisheries

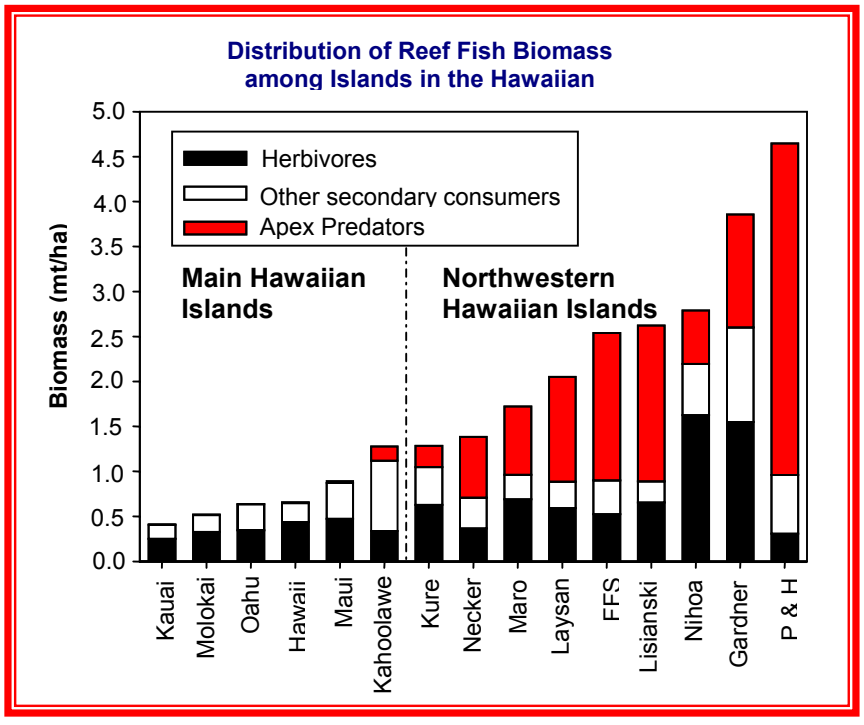
Northwestern Hawaiian Islands 2002 Cruise and Previous Years Results

The NOAA vessel *Townsend Cromwell* and the R/V *Rapture* carried scientists and educators in this year's month long exepidition Northwestern Hawaiian Islands Reef Assessment and Monitoring Program, NOWRAMP 2002. Sixty-five scientists from NOAA Fisheries Honolulu Laboratory's Coral Reef Ecosystem Investigation, National Ocean Service, Bishop Museum, Hawaii's Department of Land and Natural Resources, the U.S. Fish and Wildlife Service, University of Hawaii, University of California, and Waikiki Aquarium participated in conducting ecological assessments at 189 sites with in Northwestern Hawaiian Islands (NHWI) chain while providing educational outreach through an interactive web site (http://www.hawaiiatolls.org/index.html). This was the third consectutive year that NOAA Fisheries has participated in NOWRAMP to monitor and asses the coral reef ecosystem in this region.



Bleaching at Pearl and Hermes Atoll

The most significant finding from this year's cruise is the discovery of large scale coral bleaching in the northern most atolls, specially Kure, Midway, Pearl and Hermes Atolls, confirming earlier reports of potential bleaching in Midway Atoll by NOAA's Coral Reef Watch Satellite Monitoring. From mid-July to mid-September, sea surface temperatures were 2 to 4 degrees higher than normal at these northern atolls. Prelimary results found that vast areas of the backreef were severely bleached with many areas having suffered greater than 50% coral mortality and some areas had coral mortality close to 75%. Many of the bleached corals were over 100 years old. Minor bleaching was also reported for the southern end of the NWHI. The recovery rate for the bleached corals is not yet known, but the observations made over the past years will help managers understand the magnitude of the damage caused by this warming event.



The surveys conducted during the 2000 and 2001 cruises have enhanced scientific understanding of the ecology and oceangraphy of the NWHI, and have provided resource managers with more information on which to base decisions about this ecosystem resource. Hawaii overall has lower species richness (diversity) and high endemism of 25-30%, which is a function of its geographic isolation. Preliminary analysis suggests that NWHI has more endemic species than the MHI, which perhaps increases with latitude and has decrease representation of Indo-Pacific

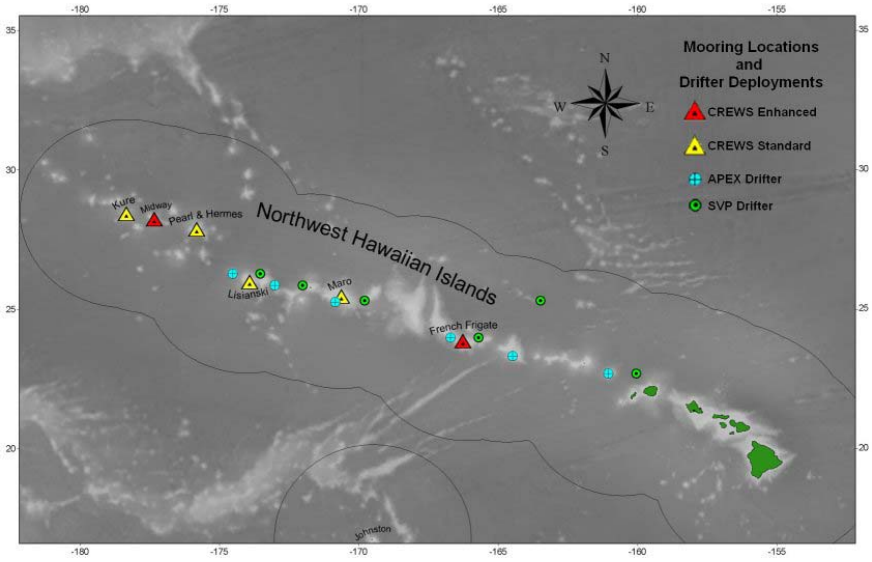
species. Also, the number of apex predators, primarily the large jacks and reef sharks, were found throughout the entire NWHI chain, which is in stark contrast to absence of apex predators in the Main Hawaiian Islands (MHI). This higher biomass of apex predator fishes in the NWHI reefs is perhaps a unique phenomenon and reflects the extended periods of low fishing pressure.

New coral species endemic to NWHI

Assessments of coral and other invertebrates in the NWHI have provided new information on distribution and species composition. Scientist have observed new ranges for 30 coral species and identified 2 to 8 new species of scleractianian coral in the NHWI; authentication and description of these new species is in development. Coral diversity in the NWHI exceeds that of MHI and is highest at atolls. Specimens from French Frigate Shoals (FFS) were among the first analyzed by collaborating with the Bishop Museum. In the FFS lagoon, a reef composed almost entirely of bivalve calms was found, a feature that is not known in the MHI. 830 species invertebrate were discovered in FFS and about 250 of those species are thought to be new records. Also, three invertebrates found settled on marine debris include a sponge, a bryozoan, and an anemone are potentially non-indigenous species (verification of species identification is in progress).

NOAA Fisheries has deployed a number of oceanographic moored buoys and drifters to help understand the physical processes that support and maintain ecosystem health. Six early warning moored CREWS buoys have been deployed in the NWHI, which collect information on sea surface temperature, air temperature, barametric pressure, and wind speed and direction, and six APEX drifters were deployed, which follow currents that transport larvae. Both sets of buoys are equipped with satellite telemetry system. This telemetered data is made available on the internet (http://crei.nmfs.hawaii.edu) to allow fisheries managers and scientists for immediate access to the Honolulu Laboratory's data. However, this site is still under development a prototype web site is available.

Mooring Locations and Drifter Deployment



For More Information:
Russell Brainard, Ph.D.
Coral Reef Ecosystem Investigation
NMFS Honolulu Laboratory
Rusty.Brainard@noaa.gov
808-592-7011

Or

Thomas Hourigan, Ph.D.
NMFS Coral Reef Coordinator
Office of Habitat Conservation
Tom.Hourigan@noaa.gov
301-713-3459

This project is an element of the NOAA Coral Reef Conservation Program.